DOCUMENT RESUME

ED 123 852 EC 090 220

AUTHOR Rondal, Jean A.; Turnure, James E.
TITLE Maternal Speech to Normal and Down's Syndrome Children Matched for Mean Length of Utterance.
PUB DATE Jun 76
NOTE 29p.; Paper presented at the Annual Meeting of the American Association on Mental Deficiency (100th, Chicago, Illinois, May 31 - June 4, 1976)

EDRS PRICE MF-$0.83 HC-$2.06 Plus Postage.
DESCRIPTORS Early Childhood; Elementary Education; Exceptional Child Research; Expressive Language; *Language Development; Language Research; Mentally Handicapped; *Mongolism; *Mothers; Parent Child Relationship

ABSTRACT

Compared were the maternal linguistic environments of 21 normal (20-32 months old) and 21 Down's syndrome children (3-12 years old) matched for level of language development as assessed by mean length of utterance (MLU). Verbal interaction in two free play home situations was tape recorded. Twenty measures of maternal speech (including sentence complexity, total number of words and different types of sentences) and seven measures of children's speech (such as incidence of utterances without verb and number of modifiers per utterance) were analyzed. Data suggested that the maternal linguistic environments of MLU matched Down's syndrome and normal children were similar, although there were significant differences in mothers' speech according to the language level of the children addressed. (CL)

****
* Documents acquired by ERIC include many informal unpublished *
* materials not available from other sources. ERIC makes every effort *
* to obtain the best copy available. Nevertheless, items of marginal *
* reproducibility are often encountered and this affects the quality *
* of the microfiche and hardcopy reproductions ERIC makes available *
* via the ERIC Document Reproduction Service (EDRS). EDRS is not *
* responsible for the quality of the original document. Reproductions *
* supplied by EDRS are the best that can be made from the original. *
****

ED123852

U S DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

Maternal Speech to Normal and Down's Syndrome Children Matched for Mean Length of Utterance

Jean A. Rondal and James E. Turnure

University of Minnesota

Paper presented at the 100th Meeting of the American Association on Mental Deficiency, Chicago, Illinois, June 1976.

EC090220

Maternal Speech to Normal and Down's Syndrome Children Matched for Mean Length of Utterance

Jean A. Rondal and James E. Turnure
University of Minnesota

Interest has arisen recently in the nature of the linguistic environment within which children develop linguistic competence. Accordingly, many recent efforts have been directed toward analyzing parental speech, especially maternal speech, addressed to young children. A number of studies have shown that mothers' speech to younger children is characterized by phonological, morphological, syntactical and semantical features that render it simpler, more regular, and, presumably, easier to process than the speech addressed to older children and adults.

In a parallel fashion, mothers' speech to their mentally retarded children has been of interest to several investigators. Marshall, Hegrenes, and Goldstein (1973) compared a sample of 20 severely and moderately retarded children and 20 normal children between 3 and 5 years of chronological age (CA), in a 15-minute laboratory play situation with their mothers. Buium, Rynders, and Turnure (1974) studied the maternal linguistic environment of five 24-month old normal and six 24-month-old Down's syndrome children in a play situation and two tutoring situations in a laboratory setting. Kogan, Wimberger, and Bobbitt (1969) made a similar study of the verbal interactions between six mentally retarded and their mothers and nine normal children and their mothers in a laboratory setting. The children were five years

old. The conclusions of the investigators were similar in the three studies: First, mothers of retarded children provide a different, generally less complex, linguistic environment than mothers of normal children. Second, mothers of retarded children tend to use a more controlling style of speech (containing more imperative sentences, for example) and to solicit leadership on the part of the child less often than mothers of normal children. In interpreting their results, these authors have offered the hypothesis that exposure to such a different type of linguistic environment may adversely affect the retarded children's language development.

The interpretation offered by Marshall et al., Buium et al., and Kogan et al. requires comment pertaining to the CA-matching used as a basis for their studies. It is know that at corresponding CA, retarded children, particularly moderately and severely retarded, do not talk in the same way as normal children. Therefore, when assembled with their mothers, the retarded children are likely to interact verbally in a way different from that of the normal children at similar CA's. As by definition a verbal interaction is an interpersonal process, it is reasonable to assume that such differences in children's speech are capable of affecting the speech of the adult interlocutor. In other words, as the three studies mentioned above have all matched normal and retarded children for CA and as at corresponding CA's normal and retarded children are at different levels of speech and language functioning, it is not clear whether the differences observed in maternal speech must be attributed to differences in the children

addressed according to type of children (retarded versus normal) or according to level of speech and language development. The more controlling style of speech used by the mothers of retarded children can also be explained in a similar manner. It is possible that relatively less mature children, such as retarded children, during comparison with their CA-matched peers proved less manageable particularly in an unfamiliar situation like the laboratory setting, and, consequently, obliged their mothers to resort to more directive speech in order to keep the children under control and cooperative.

The CA-match that served as a basis for the studies of Marshall et al., Buium et al., and Kogan et al., thus had the unfortunate consequence that it does not distinguish between the effects of type of children versus level of speech and language development (and developmental level in general) on maternal speech. The purpose of the research to be reported here was to avoid this confounding by comparing the maternal linguistic environments of normal and retarded children matched for level of language development as assessed by mean length of utterance (MLU).

The subjects of the study were 21 Down's syndrome children (9 boys and 12 girls) and their natural mothers and 21 normal children (13 boys and 8 girls) and their natural mothers. Seven normal children and seven Down's syndrome children were matched at each of three MLU levels: 1.00 - 1.50, 1.75 - 2.25, and 2.50 - 3.00. MLU was computed in number of morphemes using the criterion given in Brown (1973). The only exception to Brown's criterion was that the MLU count was based on the total speech sample (i.e., one hour speech recording)

rather than just the first 100 utterances as suggested by Brown. Normal children ranged in CA from 20 to 32 months. Down's Syndrome children ranged in CA from 3 to 12 years. The mothers of normal and the mothers of Down's syndrome children were matched on the following criteria: ethnic group (Caucasian), familial monolingualism, familial structure (both husband and wife living at home), mother free of any major sensory handicap, maternal intelligence not obviously outside the normal range, socio-economic status (predominantly middle-class), and maternal educational level (using Hollingshead's Educational Scale, after Hollingshead, Note 1).

The verbal interaction between mother and child was tape recorded at home in a free-play situation. There were two recording sessions, each lasting half-an-hour for each mother-child pair. The two recording sessions took place on two different days at approximately one-week interval. They were preceded, on another day, by a 20-minute "get acquainted session." The mothers were told that the study was primarily about child language development in a plausible attempt to keep them as unconcerned as possible about their own speech. The investigator (first author) was present in the home during the tape recording and made every effort to keep his presence as discreet as possible. In order to preserve as much spontaneousness and naturalness in the mother-child interaction as possible, no specific instruction other than "do what you usually do when you play and talk with the child and use whatever kind of toys or material you want to use, only avoid recitations", was given to the mothers as to what they should do with

the child during the free play situation.

A verbatim transcription of the speech of the mothers and of the speech of the children was made by the investigater. An utterance or vocal response unit was defined as "a unit of spoken language marked off on either side by a pause or by some change in inflection" according to Siegel (1963, Appendix H, p. 101).

Maternal speech was analyzed for 20 measures or indexes related to its output-numerical, lexical, syntactical, semantic-structural, semantic-pragmatic, and language-teaching aspects. The 20 indexes were: Total Number of Words, Type-Token Ratio (TTR), MLU, Proportions of Utterances of Specific Lengths, Sentence Complexity (i.e., ratio of the number of compound verbs plus subordinate clauses to the total number of utterances), Mean Preverb Length, Proportion of Utterances without verb, Number of Modifier per Utterance, Different Types and Subtypes of Sentences (i.e., Declarative and Imperative Sentences, Inverted Yes/No Questions, Raising Intonation Questions, WH-Questions, Occasional Questions [e.g., "He did what?"], "Mature" and "Immature" Tag Questions[1], Yes/No Inverted Questions with Deletion [e.g., "Wanna go ninight?" or "You wanna go ninight?"], Other Grammatically Incomplete Sentences, Total Proportion of Question, and Total Proportion of Yes/No Questions), Proportion of Words in Dysfluencies, Acoustical clarity (i.e., ratio of the number of totally or partially unintelligible utterances--judged from the tape recordings--to the total number of utterances analyzed), Explicit Direct Verbal Approvals and Disapprovals of Children's Utterances, Attentional Utterances, Mothers' Exact Repeti-

tions of Their Own Utterances, Auxiliary Development Ratio (i.e., ratio of the number of Yes/No inverted questions to the number of affirmative imperative sentences), Expansions and Corrections, Prodding (i.e., those utterances where the mothers made it verbally explicit that they wanted the child to say or repeat something), Mothers' Repetitions of Children's Utterances, Major and Optional Verb Types (from a semantic point of view) according to Chafe (1970) plus two additional categories: Nominations[2] and a Residual Verb Type category[3]. Proportions of Different Types of Request for Action (Direct, Indirect[4], Inferred Requests and Proposals for Joint Action) and Proportions of Adjuncts to Request for Actio (i.e., those clauses, phrases, or sentences immediately preceding or following the request and expressing his justification for making the request or checking upon the addressee's willingness to perform the requested action) according to Garvey (1975). The reader is referred to Rondal (1976) for a definition of the above categories.

Seven measures of children's speech were computed as a means of testing the validity of the MLU-matching performed on the children as a basis for the study. The seven measures or indexes were: Total Number of Words, TTR, Upper Bounds (i.e., the longest utterance for a transcription, calculated in number of morphemes), Incidence of Utterances Without Verb, Number of Modifiers per Utterance, Major and Optional Verb Types according to Chafe (1970) plus Nominations and Residual Verb Type category, and Children's Repetitions of Mothers' Utterances.

The twenty measures of maternal speech and the seven measures of

children's speech were computed on samples of speech varying between total sample of speech recorded (for some indexes like Total Number of Words produced, Upper Bounds, and Children's Repetitions of Mothers' Utterances) to 400 utterances (selected in equal number from each one of the two recording sessions) with the exception of Type-Token Ratio and Proportion of Word in Dysfluencies which were computed on 200 and 1000 words respectively.

Reliability in terms of percent agreement between two independent raters was calculated separately for those measures which seemed to involve some subjective judgment on the rater's part. Agreement was high in all instances varying between 84 and 98 percent.

Maternal speech and children's speech were analyzed separately. With a few exceptions, the measures of mothers' speech and children's speech were grouped to form clusters of variables related to syntactical semantic-structural, semantic-pragmatic, and language-teaching aspects of speech (the last two for mothers' speech only) and were analyzed by using two-way (type of children x language level) multivariate analyses of variance (MANOVA) carried out simultaneously on all the variables in each cluster (Hummel & Sligo, 1971). Following rejection of the overall null hypothesis, the MANOVA's were followed by univariate analyses of variance (ANOVA) for nonrepeated measures on each variable separately. Whenever the ANOVA showed statistical significance, cell means were compared using the Newman-Keuls Sequential-Multiple-Comparison Procedure, but the results of this test will not be reported here. The few measures that were not included in the cluster of variables were analyzed separately by a two-way ANOVA for

nonrepeated measures followed, in case of rejection of the overall null hypothesis, by the application of the Newman-Keuls procedure. Table 1 and Table 2 show the group means based on average scores for the measures of mothers' speech and children's speech, respectively. The same tables also report the significant effects obtained in the MANOVA's and ANOVA's performed on the data.

As shown in Table 1, none of the measures of children's speech computed, except for TTR that slightly but significantly favored Down's syndrome children, revealed a significant difference between normal and Down's syndrome children. The results of this analysis validated the MLU-matching performed initially. They also indicated that MLU, between MLU 1 and 3 and computed in number of morphemes, appears to be as good an indicator of level of language development for Down's syndrome children as it is for normal children according to the current psycholinguistic literature.

As shown in Table 2, none of the comparisons of mothers' speech to normal and to Down's syndrome children led to differences that were significant or close to significance for any of the three children's language levels studied. Similarly there was no significant Type of Children x Children's Language Level interaction effect on any of the comparisons made of mother's speech to normal and to Down's syndrome children. It appeared that in this study, the maternal linguistic environments of Down's syndrome and normal children of corresponding MLU were similar in all respects. Additionally, it is worth noting in the results of this study and by comparison with the data reported by Marshall et al., Buium et al., and Kogan et al., that once Down's

syndrome and normal children are matched on MLU, there are no differences left in maternal speech for proportion of imperative sentences and for any form of request for action. This suggests that the differences reported by Marshall et al., Buium et al., and Kogan et al. in those "controlling aspects" of mothers' speech were more reflective of differences in level of development in the children addressed rather than in type of child (normal versus mentally retarded).

In contrast to the absence of significant differences in maternal speech to normal and to Down's syndrome children at corresponding MLU levels, there were numerous significant differences in mothers' speech according to the language level of the children addressed. As a result of augmented linguistic capability in the children, and both for normal and Down's syndrome children, mothers were found to increase their TTR, and MLU, and correlatively to modify their proportions of utterances of specific morpheme lengths, to increase their sentence-complexity ratio, mean preverb length, number of modifiers per utterance, to modify their proportion of use of different verb types, to decrease their proportions of direct requests for action and their total proportions of requests for action, to increase their proportions of indirect request for action, to increase their proportions of adjuncts to indirect and inferred requests for action, to decrease their proportions of exact repetitions of their own utterances, and to expand, explicitly correct, and prod fewer children's utterances. This confirmed that the expressive language level of the children is a far more powerful factor in influencing maternal speech than whether they are normal or Down's syndrome children.

Based on the data reported by Buium et al., Marshall et al., and Kogan et al., and based on the interpretations these investigators offered for their data, a number of authors have begun referring more or less implicitly to the familial linguistic environment of mentally retarded children as deficient (e.g., Mitchell, 1976; Dolley, Note 2; Seitz, 1975; Mahoney, 1975; Mahoney & Seely, 1976). These authors have also indicated that this state of affairs ought to be changed.

What the results of the present investigation indicate is that the maternal linguistic environment of Down's syndrome children between MLU 1 and 3 is an appropriate one, if by appropriate it is meant the kind of linguistic environment that is generally the one of normal middle-class children at corresponding MLU. The preceding sentence remains the only, even if circular, definition that is available today of a "good" linguistic environment for first language acquisition. According to the present investigation, and within its limitation, the connotation of deficit that has become associated with the familial linguistic environment of mentally retarded children in the last ten years should be seriously reconsidered, and note should be taken, once more, of the great difficulty involved in making an appropriate and rigorous investigation in matters related to normal and abnormal children. Summarizing, it may be that the major implication of the present research for language intervention is the possibility that the familial linguistic environment of language-learning Down's syndrome children may be as appropriate for the language development of those children as the familial linguistic environment of

normal children at corresponding levels of language development. It is an open question whether similar data can be obtained and similar conclusions can be made for other groups of mentally retarded children.

Reference Notes

1. Hollingshead, A. Two-factor index of social position. Unpublished manuscript, 1957. (Available from A. Hollingshead, 1965 Yale Station, New Haven, Connecticut 06520.)

2. Dolley, D. Mothers as teachers: Instruction and control patterns observed in interaction of middle-class mothers with trainable mentally retarded and nonretarded children (Report No. 7.32). Bloomington, Ind.: University of Indiana, School of Education, Center for Innovation in Teaching the Handicapped, March 1974.

References

Brown, R. A first language: The early stages. Cambridge, Mass.: Harvard University Press, 1973.

Brown, R., & Hanlon, C. Derivational complexity and order of acquisition in child speech. In J. Hayes (Ed.), Cognition and the development of language. New York: Wiley & Sons, 1970, pp. 11-53.

Buium, N., Rynders, J., & Turnure, J. Early maternal linguistic environment of normal and Down's syndrome language-learning children. American Journal of Mental Deficiency, 1974, 79, 52-58.

Chafe, W. Meaning and the structure of language. Chicago: The University of Chicago Press, 1970.

Garvey, C. Requests and responses in children's speech. Journal of Child Language, 1975, 2, 41-63.

Hummel, T., & Sligo, J. Empirical comparison of univariate and multivariate analysis of variance procedures. Psychological Bulletin, 1971, 76, 49-57.

Kogan, K., Wimberger, H., & Bobitt, R. Analysis of mother-child interaction in young mental retardates. Child Development, 1969, 40, 799-812.

Mahoney, G. An ethological approach to delayed language acquisition. American Journal of Mental Deficiency, 1975, 80, 139-148.

Mahoney, G., & Seely, P. The role of the social agent in language acquisition: Implications for language intervention. In N. Ellis (Ed.), International review of research in mental retardation (Vol. 8). New York: Academic Press, 1976, in press.

Marshall, N., Hegrenes, J., & Goldstein, S. Verbal interactions: Mothers and their retarded children versus mothers and their nonretarded children. American Journal of Mental Deficiency, 1973, 77, 415-419.

Mitchell, D. Parent-child interaction in mental handicap. In P. Berry (Ed.), Language communication in the mentally handicapped. London: Arnold, 1976, in press.

Rondal, J. Maternal speech to normal and to Down's syndrome children matched for mean length of utterance. (Doctoral Dissertation, University of Minnesota) Ann Arbor, Mich.: University Microfilms, 1976.

Seita, S. Language intervention - Changing the language environment of the retarded child. In R. Koch & F. de la Cruz (Eds.), Down's syndrome. New York: Bruner/Mazel, 1975, pp. 157-179.

Siegel, G. Adult verbal behavior in "play therapy" sessions with retarded children. Journal of Speech and Hearing Disorders Monograph, 1963, 10, Appendix H, pp. 100-101.

Unnumbered Footnote

Paper presented at the 100th Annual Meeting of the American Association on Mental Deficiency, Chicago, Illinois, June 1976.

The paper is based on a doctoral dissertation presented by the first author to the Graduate School of the University of Minnesota and conducted under the direction of the second author.

The research presented in this paper was supported by a grant from the Belgian National Board for Scientific Research (F.N.R.S.) and by a grant from the Bureau of Education for the Handicapped, U.S. Office of Education, Department of Health, Education, and Welfare to the Center of Research and Development in Education of Handicapped Children, Department of Psychoeducational Studies, University of Minnesota.

Authors' address: Research, Development and Demonstration Center in Education of Handicapped Children, Pattee Hall, University of Minnesota, Minneapolis, Minnesota 55455.

Footnotes

1. The distinction between so-called Mature and Immature Tag Questions was made according to Brown and Hanlon (1970). In Mature Tag Questions, the form of the request for confirmation varies with the structure of the sentence to which it is appended. Negative tag questions are appended to affirmative propositions (e.g., "We went to grandma's, didn't we?") and vice versa. In Immature Tag Questions, the form of the request for confirmation is relatively free and independent of the structure of the declarative sentence. Such tag questions take the form of "Right?", "Huh?", or "Remember?".
2. Although they could be dealt with using Chafe's system, it was decided to count single-word utterances naming an object or a person as instances of Nominations (in the sense of Brown, 1973).
3. A Residual category was constituted in order to regroup more complex verb specifications than those considered in the taxonomic system used in this study. This category regrouped those verb specifications involving more than one optional verb category at a time (e.g., "Tom saw a snake in the woods," Process-experiential-locative verb).
4. Following Garvey's suggestion, the Indirect Request category was divided into two subcategories: Indirect Requests type one and Indirect Requests type two. The former subcategory includes those Indirect Request that are embedded into an utterance that makes reference to one of the four conditions for a sincere re-

quest (i.e., the speaker wants the hearer to perform a given action, assumes the hearer can do it, assumes the hearer is willing to do it, and assumes the hearer will not perform the desired action unless requested to do it). The latter subcategory includes the Indirect Request that do not conform to the above scheme. For more details on this subject, see Garvey (1975).

Table 1

Average Scores, Significant Effects on MANOVA and ANOVA for Children's Speech

Indexes	Average scores						MANOVA and ANOVA Significant effects[a]		
	Down's syndrome			Normal					
	Language level			Language level					
	1	2	3	1	2	3	Type of children	Language level	Type x Level
1. Number of words	596	1207	1632	671	1000	1541		x	
2. TTR	.37	.50	.54	.36	.40	.47	x	x	
3. Percentage of repetitions of mother's utterances	26	8	3	28	11	3		x	
Indexes 4 to 6									
4. Upper bound	2.86	6.14	11	3.57	6.29	10.57		x	
5. Proportion of utterances without verb	.87	.76	.58	.90	.74	.55		x	
6. Number of modifiers per utterance	.21	.29	.43	.19	.35	.41		x	

[a] $p \leq .05$

Table 1 (cont.)

Average Scores, Significant Effects on MANOVA and ANOVA for Children's Speech

Index 7 Verb types	Average scores: Down's syndrome, Language level 1	Down's syndrome, Language level 2	Down's syndrome, Language level 3	Average scores: Normal, Language level 1	Normal, Language level 2	Normal, Language level 3	MANOVA and ANOVA Significant effects[a]: Type of children	Language level	Type x Level
Indexes A to N								x	
A. State	.20	.28	.24	.21	.20	.26			
B. State-experiential	.03	.07	.11	.04	.04	.06		x	
C. State-benefactive	.00	.03	.04	.00	.02	.04		x	
D. State-locative	.07	.10	.11	.07	.14	.10			
E. Process	.01	.01	.02	.01	.02	.03			
F. Action	.05	.04	.05	.01	.04	.03			
G. Process-action	.02	.07	.08	.04	.06	.08		x	
H. Process-experiential and Action-experiential	.03	.05	.07	.03	.04	.09		x	
I. Process-benefactive, Action-benefactive, and Process-action-benefactive	.01	.02	.01	.00	.01	.03			

[a] $p \leq .05$

Table 1 (cont.)

Average Scores, Significant Effects on MANOVA and ANOVA for Children's Speech

Index 7 (cont.) Verb types	Average scores: Down's syndrome, Language level 1	Down's syndrome, Language level 2	Down's syndrome, Language level 3	Normal, Language level 1	Normal, Language level 2	Normal, Language level 3	MANOVA and ANOVA Significant effects[a]: Type of children	Language level	Type x Level
J. Process-instrumental, Action-instrumental, and Process-action-instrumental	.00	.00	.01	.00	.00	.01		x	
K. State-completable and Action-completable	.13	.09	.10	.05	.07	.10			
L. Process-locative, Action-locative, and Process-action-locative	.03	.05	.10	.02	.13	.09		x	
M. Nomination	.44	.18	.05	.53	.24	.07		x	
N. Residual	.00	.01	.02	.00	.00	.02		x	

[a] $p \leq .05$

Table 2

Average Scores, Significant Effects on MANOVA and ANOVA for Mothers' Speech

Indexes	Average scores: Down's syndrome, Language level 1	2	3	Average scores: Normal, Language level 1	2	3	MANOVA and ANOVA Significant effects[a]: Type of children	Language level[b]	Type x Level
1. Number of words	3643	3811	3863	3650	3475	3607			
2. TTR	.44	.49	.52	.44	.49	.49		x	
Index 3 to 8								x	
3. MLU	3.96	4.39	5.52	4.24	4.64	4.84		x	
4. Proportion of utterances of specific lengths									
Morpheme length: A. 1	.23	.22	.16	.19	.17	.19			
B. 2-3	.30	.26	.17	.26	.22	.21		x	
C. 4-6	.32	.31	.32	.37	.38	.32			
D. 7-9	.10	.13	.22	.14	.16	.19		x	
E. 10+	.05	.07	.14	.05	.07	.09		x	
5. Sentence-complexity ratio	.06	.07	.12	.06	.08	.10		x	
6. Mean preverb length	1.96	2.15	2.43	1.86	2.11	2.43		x	
7. Proportion of utterances without verb	.31	.32	.28	.28	.25	.28			
8. Number of modifiers per utterance	.57	.58	.84	.55	.68	.68		x	

[a] $p \leq .05$

[b] Children's language level.

Table 2 (cont.)

Average Scores, Significant Effects on MANOVA and ANOVA for Mothers' Speech

Index 9 Sentence Categories	Average scores: Down's syndrome, Language level 1	2	3	Normal, Language level 1	2	3	MANOVA and ANOVA Significant effects[a]: Type of children	Language level	Type x Level
Indexes A to J									
A. Declarative	.23	.25	.33	.24	.33	.32			
B. Imperative	.18	.11	.06	.16	.13	.09			
C. Inverted Yes/No question	.14	.13	.14	.17	.14	.12			
D. Intonation question	.01	.01	.01	.01	.02	.01			
E. Immature tag question	.01	.01	.02	.01	.01	.01			
F. Mature tag question	.01	.01	.02	.01	.02	.01			
G. Occasional WH-question	.00	.00	.01	.00	.00	.01			
H. Other WH-question	.26	.30	.23	.25	.18	.27			
I. Yes/No inverted question with deletion	.03	.01	.01	.03	.04	.02			
J. Other grammatically incomplete sentence	.13	.17	.16	.12	.13	.14			
K. Total Yes/No questions	.21	.17	.21	.24	.22	.17			
L. Total questions	.47	.47	.45	.49	.41	.45			

[a] $p \leq .05$

[b] Children's language level.

Table 2 (cont.)

Average Scores, Significant Effects on MANOVA and ANOVA for Mothers' Speech

Index 10 Verb types	Average scores Children's addressed Down's syndrome Language level 1	2	3	Normal Language level 1	2	3	MANOVA and ANOVA Significant effects[a] Type of children	Language level[b]	Type x Level
Indexes A to N								x	
A. State	.31	.23	.21	.27	.23	.21			
B. State-experiential	.08	.07	.09	.06	.07	.07			
C. State-benefactive	.03	.02	.04	.02	.03	.03			
D. State-locative	.06	.09	.05	.10	.10	.08			
E. Process	.01	.03	.03	.02	.02	.04		x	
F. Action	.05	.04	.05	.04	.03	.05			
G. Process-action	.03	.05	.06	.05	.06	.09			
H. Process-experiential and Action-experiential	.07	.08	.11	.07	.09	.08			
I. Process-benefactive, Action-benefactive, and Process-action-benefactive	.02	.03	.02	.04	.05	.02			

[a] $p \leq .05$

[b] Children's language level

Table 2 (cont.)

Average Scores, Significant Effects on MANOVA and ANOVA for Mothers' Speech

Index 10 (cont.) Verb types	Average scores: Children's addressed — Down's syndrome: Language level 1	2	3	Normal: Language level 1	2	3	MANOVA and ANOVA: Significant effects[a] — Type of Children	Language level	Type x Level
J. Process-instrumental, Action-instrumental, and Process-action-instrumental	.01	.00	.01	.01	.00	.01			
K. State-completable and Action-completable	.13	.14	.14	.13	.10	.11			
L. Process-locative, Action-locative, and Process-action-locative	.06	.07	.13	.07	.16	.13		x	
M. Nomination	.10	.03	.01	.10	.03	.02		x	
N. Residual	.05	.06	.07	.02	.04	.05		x	

[a] $p \leq .05$

[b] Children's language level.

Table 2 (cont.)

Average Scores, Significant Effects on MANOVA and ANOVA for Mothers' Speech

Index 11 Requests for action	Average scores: Children's addressed — Down's syndrome, Language level 1	Down's syndrome, Language level 2	Down's syndrome, Language level 3	Normal, Language level 1	Normal, Language level 2	Normal, Language level 3	MANOVA and ANOVA Significant effects[a]: Type of children	Language level	Type x Level
Indexes A to E and G and H								x	
A. Direct request	.11	.07	.03	.12	.08	.06		x	
B. Proposal for joint action	.02	.01	.02	.03	.02	.02		x	
C. Indirect request type one	.04	.01	.01	.03	.03	.01		x	
D. Indirect request type two	.01	.01	.01	.01	.01	.01			
E. Inferred request	.00	.00	.00	.00	.00	.00			
F. Total request[c]	.18	.11	.07	.19	.13	.10		x	
G. Total adjuncts to request	.10	.15	.13	.12	.19	.22			
H. Adjunct to indirect and to inferred requests	.14	.30	.17	.17	.26	.19		x	

[a] $p \leq .05$.

[b] Children's language.

[c] Including Proposals for joint action.

Table 2 (cont.)

Average Scores, Significant Effects on MANOVA and ANOVA for Mothers' Speech

Indexes	Average scores: Children addressed: Down's syndrome: Language level 1	2	3	Normal: Language level 1	2	3	MANOVA and ANOVA: Significant effects[a]: Type of children	Language level	Type x Level
Indexes 12 to 20								x	
12. Proportion of words in dysfluencies.	.01	.01	.03	.01	.01	.01			
13. Proportion of unintelligible utterances	.01	.02	.04	.03	.03	.04			
14. A. Proportion of explicit direct approvals of children's utterances	.27	.21	.23	.20	.14	.17			
B. Proportion of explicit direct verbal disapprovals of children's utterances	.06	.04	.03	.03	.02	.04			
15. Proportion of attentional utterances	.17	.10	.12	.13	.14	.09			
16. Proportion of mothers' exact repetitions of their own utterances	.09	.03	.02	.08	.04	.03		x	

[a] $p \leq .05$.

[b] Children's language level.

Table 2 (cont.)

Average Scores, Significant Effects on MANOVA and ANOVA for Mothers' Speech

Indexes	Average scores: Children addressed: Down's syndrome: Language level 1	Down's syndrome: Language level 2	Down's syndrome: Language level 3	Normal: Language level 1	Normal: Language level 2	Normal: Language level 3	MANOVA and ANOVA: Significant effects[a]: Type of children	Language level	Type x Level
17. Auxiliary development ratio	1.38	2.34	3.14	1.50	3.08	2.19			
18. A. Proportion of expansions of children's utterances	.15	.09	.06	.13	.11	.04		x	
B. Proportion of explicit corrections of children's utterances	.03	.03	.00	.04	.02	.02		x	
19. Proportion of prodding utterances	.04	.00	.00	.02	.01	.00		x	
20. Proportion of mothers' repetitions of children's utterances	.14	.10	.09	.11	.08	.06			

[a] $p \leq .05$

[b] Children's language level.